

In the Claims

1. A method for recovering texture of a textured article comprising the steps of:
  - 5 first creating on a surface of the article a high temperature stable surface coating; and
  - second performing a solution heat treatment on said article, thereby maintaining said thermally stable surface coating
- 10 and keeping a textured microstructure.
2. The method according to claim 1, wherein said article is made from a superalloy.
- 15 3. The method according to claim 2, wherein said superalloy is nickel-based.
4. The method according to claim 2, wherein said superalloy is cobalt-based.
- 20 5. The method according to claim 3, wherein a  $\gamma$ -phase and a  $\gamma'$ -phase are present in said superalloy and wherein the temperature of said solution heat treatment is at least the solution temperature of the  $\gamma'$ -phase.
6. The method according to claim 2, wherein said solution heat treatment is performed with a temperature above 1100 °C.
- 30 7. The method according to claim 2, wherein said solution heat treatment is performed with a temperature above 1150 °C.
- 35 8. The method according to claim 2, wherein said solution heat treatment is performed with a

temperature above 1200 °C.

9. The method according to claim 1,  
wherein said article is a gas turbine blade.

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10. The method according to claim 1,  
wherein said surface coating is an aluminide coating.

11. The method according to claim 1,

10 wherein said surface coating is an oxide film or scale  
generated by oxidation of the surface.

12. The method according to claim 10,

15 wherein said aluminide coating is provided by a chemical  
vapor deposition process.

13. A method for refurbishing a gas turbine blade made from a  
textured superalloy body coated with a protective coating,  
the method comprising the steps of:

20 coating a surface of said body with a high temperature  
stable surface coating, thereby covering said protective  
coating;

performing a solution heat treatment on the body, thereby  
maintaining said thermally stable surface coating;

25 removing jointly said surface coating and said protective  
coating; and

providing a second protective coating on said body.

14. The method according to claim 13,

30 wherein a  $\gamma$ -phase and a  $\gamma'$ -phase are present in said  
superalloy and wherein the temperature of said solution  
heat treatment is at least the solution temperature of the  
 $\gamma'$  phase.

- 35 15. The method according to claim 13,

wherein said solution heat treatment is performed with a

temperature above 1100 °C.

16. A method for refurbishing a gas turbine blade made from  
a textured superalloy body coated with a protective

5 coating, the method comprising the steps of:  
removing the protective coating;  
coating a surface of said body with a high temperature  
stable surface coating;  
performing a solution heat treatment on said body, thereby  
10 maintaining said thermally stable surface coating;  
removing the surface coating; and  
providing a second protective coating on said body.

17. The method according to claim 15,

15 wherein a  $\gamma$ -phase and a  $\gamma'$ -phase are present in the  
superalloy and wherein the temperature of said solution  
heat treatment is at least a solution temperature of the  
 $\gamma'$ -phase.

20 18. The method according to claim 15,

wherein said solution heat treatment is performed with a  
temperature above 1100 °C.

19. The method according to claim 1, 13 or 16,

25 wherein the textured article is a single crystal article.

20. The method according to claim 1, 13 or 16,

wherein the textured article is a directionally solidified  
article.

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21. The method according to claim 1,

wherein said surface is applied with an appropriate  
surface coating.

35 22. The method according to claim 1,

wherein the surface layer is applied to a region which has been newly built up, in particular has been produced by build-up welding.

- 5    23. The method according to claim 1,  
      wherein the surface layer is applied to a region which  
      surrounds a repaired crack.
- 10    24. The method according to claim 1,  
      wherein a metallic surface layer, in particular of nickel  
      or cobalt is used.
- 15    25. The method according to claim 24,  
      wherein the metallic layer is applied by electroplating.
- 20    26. The method according to claim 24,  
      wherein the surface layer is applied by cold gas spraying.
- 25    27. The method according to claim 24, 25 or 26,  
      wherein the surface layer is removed by means of an acid  
      treatment.
- 30    28. A method for refurbishing a gas turbine blade made from  
      a textured superalloy body coated with a protective  
      coating, the method comprising the steps of:  
            coating a surface of said body with a high  
            temperature stable surface coating, thereby covering said  
            protective coating;  
            performing a solution heat treatment on the body  
      wherein a  $\gamma$ -phase and a  $\gamma'$ -phase are present in said  
      superalloy and wherein the temperature of said solution  
      heat treatment is at least the solution temperature of the  
       $\gamma'$  phase, thereby maintaining said thermally stable  
      surface coating;
- 35          removing jointly said surface coating and said  
            protective coating; and

providing a second protective coating on said body, wherein grain recrystallization is suppressed by providing bulk conditions which assure a higher temperature threshold for grain recrystallization.

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29. A method for refurbishing a gas turbine blade made from a textured superalloy body coated with a protective coating, the method comprising the steps of:

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removing the protective coating;

coating a surface of said body with a high temperature stable surface coating;

performing a solution heat treatment on said body wherein a  $\gamma$ -phase and a  $\gamma'$  phase are present in the superalloy and wherein the temperature of said solution heat treatment is at least a solution temperature of the  $\gamma'$ -phase, thereby maintaining said thermally stable surface coating;

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removing the surface coating; and

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providing a second protective coating on said body,

wherein grain recrystallization is suppressed by covering areas with said surface coating.

30. A method for recovering texture of a textured article which is made from a superalloy, comprising the steps of:

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creating on a surface of the article a high temperature stable surface coating; and

performing a solution heat treatment on said article wherein a  $\gamma$ -phase and a  $\gamma'$ -phase are present in said superalloy and wherein the temperature of said solution heat treatment is at least the solution temperature of the  $\gamma'$ -phase, thereby maintaining said thermally stable surface coating, restoring the microstructure of the textured article, and suppressing grain recrystallization by providing bulk conditions which assure a higher temperature threshold for grain recrystallization.

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31. The method according to claim 30, wherein said article is a gas turbine component.
32. The method according to claim 31, wherein said gas  
5 turbine component is a blade or a vane.
33. The method according to claim 30, wherein said superalloy  
is cobalt-based with precipitations or carbides that  
provide a strengthening mechanism similar to a  $\gamma$ -phase in  
10 Nickel based alloys.